II. AMENDMENTS TO THE CLAIMS

Claim 1. (Currently Amended) A chimeric photoprotein obtained by replacing a region of Obelin protein with a corresponding region of Clytin photoprotein, wherein said region is located between residue 42 and 122 of the Obelin protein sequence (SEQ ID NO: 2). ~~comprised between the first and the second calcium binding sites with a corresponding region of a photoprotein selected from Clytin, Aequorin, Thalassicolin, Mitocromin, Mnemiopsin and Berovin.~~

Claim 2. (Original) A chimeric photoprotein according to claim 1, wherein said corresponding region within the selected photoprotein matches Obelin sequence in respective sequence alignments with the exception of at least 1 amino acid residue.

Claim 3. (Original) A chimeric photoprotein according to claim 2, wherein said corresponding region within the selected photoprotein matches Obelin sequence in respective sequence alignments with the exception of at least 5 amino acid residue.

Claim 4. (Original) A chimeric photoprotein according to claim 3, wherein said corresponding region within the selected photoprotein matches Obelin sequence in respective sequence alignments with the exception of at least 10 amino acid residue.

Claim 5. (Canceled)

Claim 6. (Currently Amended) A chimeric photoprotein according to claim [[5]] 1, wherein said region extends from residue 50 to 94 of Obelin protein sequence.

Claim 7. (Original) A chimeric photoprotein according to claim 6, in which residues 50 to 94 of Obelin protein are replaced with a fragment of Clytin sequence extending from residue 53 to 97.

Claim 8. (Currently Amended) A chimeric photoprotein according to claim 7, having the amino acid sequence of SEQ ID [[N.]] NO: 3.

Claim 9. (Original) A chimeric photoprotein according to claim 1, further comprising one or more amino acid substitutions at positions 55, 66, 67, 73, 74, 75, 78, 83, 84, 87, 89 and 94 of Obelin sequence.

Claim 10. (Previously Presented) A fusion protein containing the photoprotein of claim 1.

Claim 11. (Previously Presented) A conjugation product between a photoprotein according to claim 1 and a molecule for analytical, diagnostic or therapeutic use.

Claim 12. (Previously Presented) An isolated nucleic acid molecule encoding a chimeric photoprotein according to claim 1.

Claim 13. (Currently Amended) An isolated nucleic acid molecule according to claim 12, encoding the protein, having a sequence selected from SEQ. [[N.]] NO: 4 and SEQ ID [[N.]] NO: 5.

Claim 14. (Currently Amended) A method for detecting calcium ions, comprising using the ~~The use of a~~ chimeric photoprotein according to claim 1, in combination with a luciferin substrate~~, for the detection of calcium ions~~.

Claim 15. (Currently Amended) The method [[use]] according to claim 14, wherein said luciferin substrate is coelenterazine.

Claim 16. (Currently Amended) The method [[use]] according to claim 14, for the quantitative determination of calcium ions.

Claim 17. (Currently Amended) The method [[use]] according to claim 14, for the determination of intracellular calcium concentration.

Claim 18. (Previously Presented) A host cell bearing a nucleic acid molecule according to claim 12.

Claim 19. (Original) The cellular host of claim 18, which is selected from bacterial, yeast, fungal, plant, insect and animal cells.

Claim 20. (Previously Presented) A method for producing a photoprotein, which comprises growing the host cell of claim 18 in conditions suitable for photoprotein expression, and recovering the expressed protein.

Claim 21. (Previously Presented) A method for the screening of biologically active molecules, which comprises exposing a cellular host according to claim 18 to a definite amount of said molecules and detecting any variation of intracellular calcium concentration.

Claim 22. (Original) A method according to claim 21, wherein the host cell is transfected with a heterologous G-protein coupled receptor or ion channel.

Claim 23. (Currently Amended) A method for determining the amount of a molecule for analytical, diagnostic or therapeutic use, comprising using ~~The use of~~ a conjugation product according to claim 11 in a competitive solid-phase immunoassay ~~for determining the amount of said molecule in biological samples~~.

Claim 24. (Original) A Bioluminescence resonance energy transfer (BRET) system, comprising a fluorescent protein and the photoprotein of claim 8.